



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,065	09/15/2003	Jian Dong	038190/29-4894	1939
67141	7590	04/30/2008	EXAMINER	
ALSTON & BIRD, LLP BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000			ORTIZ RODRIGUEZ, CARLOS R	
			ART UNIT	PAPER NUMBER
			2123	
			MAIL DATE	DELIVERY MODE
			04/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/662,065

Applicant(s)

DONG, JIAN

Examiner

CARLOS ORTIZ RODRIGUEZ

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/28/07 have been fully considered. The currently presented claims are better claiming the subject matter which the Applicant considers as his invention. Therefore, the previous rejections under of the first and second paragraph of 35 U.S.C. 112 have been withdrawn. However, please see below, claim objections regarding minor informalities and rejections under 35 U.S.C. 103 based on newly cited references.

Specification

2. The abstract of the disclosure is objected to because the phrase: "By developing a service load history database; Combining multiple time series models; Adjusting the change of each time series model creating an accelerated service load model; regenerating a random vibration load data; and Feeding the load data to drive an actuator for a high fidelity random vibration simulation test", seems to have a semantic problem (see Abstract Lines 4-7). Correction is required.

Claim Objections

3. (Claim 1, Line 1) objected to because of the following informalities: The term "The method" would be better if written as "A method". This seems to be a typographical error. Appropriate correction is required.

Art Unit: 2123

4. (Claim 1, Lines 3-10) objected to because of the following informalities: The period after each step number, seems to a typographical error and should be deleted.
5. (Claim 1, Line 10) objected to because of the following informalities: The term "the load data" would be better if written as "random vibration load data" in order to maintain consistency throughout the claim. Appropriate correction is required.
6. (Claim 2, Lines 3) objected to because of the following informalities: The term "tests" seems to be "service loads". Appropriate correction is required.
7. (Claim 3, Line 2) objected to because of the following informalities: It would be better if the term "the parameter ϕ_i ($i=1, \dots, n$) of each of the time series models" is written as "the parameter of each of the time series models". And adding at the end of the claim the following language: "and wherein ϕ represents said parameter of each of the time series models for $i=1, \dots, n$." Appropriate correction is required.
8. (Claim 3, the last line) objected to because of the following informalities: There seems to be an extra comma before the ending period. Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christoph Leser, "On stationary fatigue load modeling using autoregressive moving average (ARMA) models", Virginia Polytechnic Institute and State University, November 1993 (hereinafter Leser) in view of Carver et al. U.S. Patent No. 4,030,208 (hereinafter Carver).

a. **Regarding claim 1**, Leser discloses a method of simulating service loads comprising the steps of:

a) developing a service load history database including multiple time series models representative of different service load conditions (see for example Page 14, the section labeled "3.1 Model Description", sequences y_t and x_t , Page 45, the section labeled "5.2 Time Series Model" and Pages 64-67, 71, 75);

b) combining the multiple time series models (see for example equations 3.1-3.5 and Page 19, second paragraph);

c) adjusting a parameter of each of the time series models and creating an accelerated service load model (see for Page 16, last paragraph);

d) regenerating random vibration load data based upon the accelerated service load model (see for example Page 64 and 65).

But Leser fails to clearly specify feeding the load data to a drive simulation system to thereby cause the drive simulation system to simulate service loads in accordance with the random vibration load data.

However, Carver discloses feeding the load data to a drive simulation system to thereby cause the drive simulation system to simulate service loads in accordance with the random vibration load data (Abstract, C4 L1-9 and Figure 1, elements 23 and 25).

Leser and Carver are analogous art because they are from the same field of endeavor. They both relate to techniques of representing service loads.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above method disclosed by Leser and combining it with the invention disclosed by Carver.

One of ordinary skill in the art would have been motivated to do this modification in order to provide a simple, economical, straight-forward and more realistic simulation as suggested by Carver (see for example, C2 L45-67).

b. **Regarding claim 2**, the combination of Leser and Carver discloses all the limitations of the base claims as outlined above. Leser further discloses wherein said step of developing a service load history database further comprises modeling original random vibration tests in different time series models (see for example Page 65).

c. **Regarding claim 3**, the combination of Leser and Carver discloses all the limitations of the base claims as outlined above. Leser further discloses wherein said step of adjusting the parameter θ_i ($i=1, \dots, n$) of each of the time series models

Art Unit: 2123

further comprises changing a value of a variance σ_a^2 (see for example Page 17, "the ARMA model represented in the frequency domain and Page 15 Line 10),

where

$$f(\omega) = \frac{\Delta \sigma_a^2}{2\pi |e^{j\omega\Delta} - \phi_1 e^{j\omega\Delta} - \dots - \phi_n|^2}, \quad -\frac{\pi}{\Delta} \leq \omega \leq \frac{\pi}{\Delta},$$

wherein $f(\omega)$ is an autospectrum of the time series model for a sampling interval

Δ as a

function of angular frequency ω (see for example Page 17, "the ARMA model represented in the frequency domain"). *Please note that this autospectrum $f(\omega)$ is the autospectrum of a generic AR model. AR models are approximations of ARMA models. Since this autospectrum is not specific to a particular application it is considered as a basic/generic representation in frequency domain of the AR/ARMA model.*

d. **Regarding claim 4**, the combination of Leser and Carver discloses all the limitations of the base claims as outlined above. Leser further discloses wherein said step of regenerating the random vibration load data is based upon a recursive formula (see for example the ARMA models).

e. **Regarding claim 5**, the combination of Leser and Carver discloses all the limitations of the base claims as outlined above. Carver further discloses wherein said step of feeding the load data to a drive simulation system further comprises converting a digital signal to an analog signal and transmitting said analog signal to actuators (Abstract, C4 L1-9 and Figure 1, elements 23 and 25).

Citation of Pertinent Prior Art

11. Applicant is respectfully requested to fully consider all the references, in entirety, that appear on the attached list (Form PTO-892). These references disclose subject matter similar to that of applicant's disclosure and may be relied on in a future response to Applicant's remarks or amendments.

Please note below a list of the publications that appear on the Form PTO-892 including their relevance to the instant application.

a. Patankar et al., "State-space modeling of fatigue crack growth in ductile alloys", Elsevier Science Ltd., 2000.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Ortiz-Rodriguez whose telephone number is 571-272-3766.

Art Unit: 2123

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Carlos Ortiz-Rodriguez
Patent Examiner
Art Unit 2123

May 1, 2008

/Paul L Rodriguez/
Supervisory Patent Examiner, Art Unit 2123